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Summary of Pollution-Caused Fish Kills Reported in 1961 (2nd Annual Report)

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16. Abstract (Limit: 200 words)

The report is an analysis of pollution-caused fish kills compiled from data supplied by State officials. It includes analytical text and the following tables: summaries by State, source, water body, average number of fish killed, changes in aquatic food organisms, corrective action, severity, selected questions, type of water, month, and duration. Also includes a cummulative listing of the reports received.

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POLLUTION-CAUSED FISH KILLS IN 1961

Issued by the

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Public Health Service

Division of Water Supply and Pollution Control

Basic Data Branch

Washington 25, D.C.

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Public Health Service Publication No. 847
(1961 Edition)

SUMMARY OF POLLUTION-CAUSED FISH KILLS REPORTED IN 1961

This is the second annual summary report of pollution-caused fish kills published by the Public Health Service. In early 1960, the Surgeon General asked all State conservation and fish and game agencies to assist him by reporting instances of fish kills attributable to pollutants entering the streams or lakes of the Nation. Existing surveillance procedures were to be used in gathering the information. A self-addressed, postcard reporting form was devised in cooperation with the U.S. Fish and Wildlife Service and the various independent conservation organizations. The form, reproduced as figure 1, was furnished to the State agencies to be completed as occasions arose and mailed to the Basic Data Branch of the Division of Water Supply and Pollution Control, U.S. Public Health Service, Washington 25, D.C.

The response was enthusiastic and continues to be so. More State agencies cooperated in 1961 than in 1960, and coverage was more complete.

The 1960 annual summary included reports of fish kills only from June 1, 1960 when the program first went into effect, through the end of 1960, plus a few reports of fish kills which occurred before June 1. During 1961, two other cumulative listings were published. The first reported fish kills for January–June 1961. The second covered the period January–September 1961. The present report and summary includes all reported fish kills for the year 1961, along with statistical tabulations and some interpretative remarks.

Handling of the Reports

As reports are received, copies are furnished to the U.S. Fish and Wildlife Service, even if the reports are not to be included in the tabulations. Reports of fish kills not related to pollution are excluded. For example, a fish kill caused by a lack of sufficient dissolved oxygen arising from natural biological activity is excluded. Also omitted are some reports on shellfish which died of causes not connected with pollution. Of the total reports received, however, only a small number are excluded.

Acceptable reports are coded for machine punch card tabulation so that various breakdowns can be obtained. The punch card method permits the insertion of late reports in the proper time sequence.

Limitation in Significance

This activity was initiated by the Public Health Service in response to the need for additional information on the effect of pollution in the Nation's waters. Although many fish kills have been reported, it is realized that these comprise only a rough measure of pollution. Such reports do not take into account the effects of adding to a stream small quantities of pollutants which may not kill fish but which still have a significant effect on the aquatic food organisms which support fish life. They do not take into account weak pollutants which inhibit fish growth and fish reproduction, nor the effects of pollutants which cause flesh tainting, rendering fish unpalatable for human consumption. Additional studies are now under active consideration in the Public Health Service relating to the effects of pollutants on benthic and other aquatic organisms, which in turn are important to fish populations.

Coverage

Reported fish kills included in this summary come from 45 States. The extent of coverage varies. In some States extensive efforts are made to collect reports on all fish kills. In others, this information is developed only when prosecution for a fish kill case occurs. Not all States have the same area or amount of surface water. Population densities and industrial and agricultural activities, all of which affect water quality, differ from State to State.

States which did not report any fish kills are:

Alaska	Oklahoma
Delaware	Vermont
Nevada	

Though these States are participating in the program, they stated that during 1961 either no known fish kills occurred or they were not of sufficient significance in their opinion to be reported. In no instance was any State asked to modify its existing methods of self-notification, but merely to pass on to the Public Health Service

such information relating to fish kills as was developed in connection with its normal operating procedures.

Relationship of Fish Kills to Pollution

It is frequently difficult to determine that a fish kill has been directly or indirectly caused by pollution. In some cases fish kills have public health implications, but in others the health significance may be obscure. Identifying a specific toxic chemical or substance is usually an involved, sometimes impossible, procedure. However, each kill listed and tabulated in the report was, in the opinion of the State representative, directly related to pollution. Details vary widely from State to State from a simple statement of the kind of pollution to the incrimination of a specific chemical. If more than one type of pollution was involved, all are listed. The Public Health Service has accepted the individual reports as being the considered judgment of the initiating State agency and publishes the information as such. While a few reports might conceivably be questioned, a review of all the returns presents a convincing picture of careful field work performed by many conscientious public servants.

The Data

During 1961, the first full year of operation of the reporting system, a total of 411 notifications of pollution-caused fish kills were received from 45 States (table 1). Of these, 263 indicated the number of fish killed. Others reported "many," "several thousand," or gave a figure in pounds. These reports are shown in the detailed listing but the column under "Reporting Number of Fish Killed" is left blank. While the number reported in any one kill is only an estimate, at best, that number has been used in the tables without any attempt at rounding. *No fictitious accuracy is implied by this procedure.* The use of the figures as reported does, however, avoid the vexing problem of balancing between tables. The number shown should be considered a minimum, for reasons given above. A total of nearly 15 million fish were reported killed in the 263 instances where a numbered estimate was given. River mileage affected, given in 240 reports, amounted to 1,686 miles. In addition, 51 miles of lake and bayshore line were affected, as were 5,967 acres of lakes, reservoirs and bays.

Sources of Pollution

Because more than one source of pollution was sometimes assigned by the reporting agency, a total of 444 sources are given for the 411 reports. As shown by table 2, 82 percent, or all but 79 reports, identified the source of pollution. Industrial wastes accounted for the largest number of kills, 159, or 44 percent of the number of known sources. This percentage compares with 39 percent, the largest, in 1960. Agricultural poisons were again second in number, with 75 kills, or 21 percent, compared with 32 percent of known sources in 1960.

In numbers of fish killed, agricultural poisons were more damaging than industrial wastes, accounting for 5.6 million compared with 2.9 million. Slightly more fish were killed from unknown sources than from agricultural poisons, 5.7 million compared with 5.6 million.

Exceptionally Large Fish Kills

Four kills of a million or more account for 12,637,580 fish, or nearly 85 percent of the 14,918,113 total reported. It is felt, therefore, that some mention should be made of the circumstances of each of these kills. They are listed in the sequence in which they occurred.

Illinois River near Creve Coeur, Illinois

On August 1, a rubber hose was ruptured under pressure while being used to unload anhydrous ammonia from a tank on a barge moored at the dock of a chemical company at Creve Coeur, Illinois. Huge quantities of ammonia fumes were released into the air and absorbed into the river water. As a result, over 5,000,000 fish, including carp, buffalo, and bluegills, were killed. The escape of the fumes also caused a civil emergency; about 10,000 persons from Creve Coeur, Bartonville, North Pekin, and Marquette Heights were evacuated, and 42 were sent to hospitals. Much damage to vegetation and insect life resulted.

Slocum Creek, Cherry Point Marine Air Base, North Carolina

This kill was first observed on October 9 by the Post Game Warden of the Cherry Point Marine Air Base. Investigation revealed a kill of an estimated 5,000,000 menhaden (*Brevoortia tyrannus*). Dead fish lined the banks of Slocum Creek

for approximately 1½ miles upstream from the Base sewage disposal plant. When an official investigation was made on October 12, no evidence of fish in distress could be found, and a large school of menhaden was found actively feeding in the effluent from the sewage treatment plant. No positive cause of the fish kill could be established. However, a heavy layer of a tarlike substance was observed on the vegetation in and near the mouth of a small tributary ditch about 150 yards above the treatment plant discharge. It was determined that this substance had entered the ditch in the vicinity of the Cherry Point land fill, but the exact point of entrance was not located. According to State authorities, the kill might possibly have been related to the presence of this substance, or perhaps to a toxic substance which passed unchanged through the sewage treatment plant. Proper Base officials were requested to take precautionary measures in the operation of the treatment plant and the land fill.

North Branch, Susquehanna River near Wilkes-Barre, Pennsylvania

During the period October 9–14, one of the most devastating kills of warm water game fish in the history of the State occurred in the North Branch of the Susquehanna River. It was estimated that more than a million fish of all species were killed, including over 15,000 walleyes and over 14,000 bass of legal size. The cause of the kill was the pumping of acid mine waters into the Susquehanna during a period of comparatively low flow. Legal action was brought against the mining company responsible, and a total of $58,504.50 damages was requested to be paid into the Pennsylvania Fish Fund as payment for the fish killed. The Pennsylvania Fish Commission estimated that it would require at least 3 years to rehabilitate the river and re-establish an appreciable fish population. This kill, with its large numbers of game fish involved and subsequent legal action, attracted wide attention.

Watauga Arm of Boone Reservoir, near Johnson City, Tennessee

During November 10–11, there occurred a massive fish kill of unknown origin, covering about 200 acres on the Watauga side of Boone Reservoir near Johnson City, Tennessee. Estimates show that about 1,250,000 fish weighing between 40,000 and 60,000 pounds were lost. Five percent were game fish including largemouth bass, crappie, bluegill, and warmouth; the remainder were rough and forage fish such as carp, carpsucker, channel catfish, and shad. It was first thought that an epidemic of fish disease might have been responsible, but a report from the Eastern Fish Disease Laboratory of the U.S. Fish and Wildlife Service at Leetown, West Virginia, indicated that the specimens examined harbored no disease that could have been responsible for such a die-off. The Tennessee Game and Fish Commission, with the cooperation of the Tennessee State Stream Pollution Control Board, conducted an intensive investigation to determine the cause of the fish kill, but so far as is known at the present writing, no clear-cut answer has been found.

Increase in Average Size of Kills

The average size of kills reveals some interesting comparisons. Discounting the four large kills mentioned above, and seven others of 100,000 or more, the remaining 278 averaged 6,535 or nearly 2¼ times as large as the kills reported in 1960 (table 3). Industrial wastes had the largest average for known sources, as in 1960. Agricultural poisons went from third to second place. Ranking has little comparative value, however, in view of the fact that all averages increased by 80 to 220 percent.

If the appropriate averages are applied to the reports that did not give a number of fish killed, it would appear that the 411 reports in this annual summary indicate a total kill of nearly 16.7 million fish, including 782,000 reported from more than one source (table 3).

Types of Fish Killed

Eighty-five percent of those reporting indicated a percentage distribution of the types of fish killed among game, forage, and rough or trash fish. Matching these figures with reports giving the number of fish killed indicates that in 1961, 4.9 percent of the fish were of the game type, 83.3 percent were forage fish, and 11.8 percent were rough or trash fish (table 4). On the basis of these percentages, the estimated 16,700,000 fish represented by the 411 reports would divide into 814,000 game fish, 13,914,000 forage fish, and 1,964,000 rough or trash fish. These are further divided among sources of pollution (table 5).

A comparison of the relative distribution of types of fish killed in 1961 and 1960 is also shown in table 5. Relative to the other two types, nearly four times as many forage fish were killed in 1961 as the year previous. A lesser proportion of game and rough fish was killed in 1961.

Type of Water Body

As might be expected, most of the kills were in rivers, 340 out of 411 reports. Of these, 199 reported 12.6 million fish killed, and 240 indicated a total of 1,686 miles of stream affected (table 6). In addition, 1.5 million fish died in 2,149 acres of lake and along 48 miles of shoreline, together with ¾ million fish in 3,818 acres of bay area. It should be pointed out that most of this bay total consists of repeated reports about approximately 150 acres in the Los Angeles Harbor; it is not known whether it is the same 150 acres reported each time.

Of the 15 million fish reported killed, 9 million were fresh water fish, and 5.2 million were in brackish water (table 7). Of the latter, over 5 million were in the large North Carolina kill described.

Other Data

One question asked on the report form was whether, in the respondent's opinion, any significant change occurred in aquatic food organisms. The 23 percent who answered this question (including 20 respondents who reported no change) compares with a 40 percent response in 1960. The 1961 response, arranged by source of pollution, is shown in table 8.

Nearly two-thirds of respondents suggested specific corrective action; 6 reported no action was needed (table 9).

Of the total responses, two-thirds gave numbers of fish killed, 92 percent expressed the extent of the kill as "total", "heavy", "light", etc. (table 10), and 93 percent named a specific causative agent (table 11).

Tables 12 through 16 carry other data relating to this report.

Evaluation of Reporting

An attempt was made to evaluate the quality of reporting in 1961 as compared with 1960. This was done by examining the degree of completeness of answers to questions on the reporting card. The upper half of table 17 shows the percent of specific answers to selected questions. The lower half shows the 1961 percentage completeness divided by the 1960 percentage completeness. When this ratio is above 100, an improvement over the previous year's reporting is indicated. Any ratio under 100 indicates a decrease in the completeness of reporting. A look at the totals indicates an encouraging improvement in nearly all areas, and especially in tagging specific causative agents. There is a decline in the reporting of two items. The degree of response to geographic extent of damage is down 4 percent. Expressions of opinion on aquatic food changes in 1961 numbered only about half those of 1960.

State Agencies' Comments

Comments were requested on the reporting form. Although these cannot be tabulated and summarized, they are most pertinent in elaborating on the reasons for the fish kills, the significance of the real or suspected pollutant, and sometimes reveal the action taken by the agency to suspend further pollution. Most of the comments have been made by fish and game wardens and conservation inspectors and show the seriousness of the pollution problem as measured by the fish kills. As in the 1960 summary, there is included below a sampling of the remarks made on the individual reports. Each report is shown as a separate paragraph, substantially as made by the State official.

* * * * * * *

Kill caused by dairy wastes. Treatment facilities of the dairy consist of spraying wastes on a field, too much waste on too small an area.

* * * * * * *

Kill caused by plating wastes. Wastes were by-passed by the sewage treatment plant into the river.

* * * * * * *

Toxic pulp and paper wastes killed 1,500 fish. This kill was quite similar to the kill of 1958 which occurred in the same area. Fish sampling in the kill area below the pulp mill produced no whitefish.

* * * * * * *

Soil sealer was applied to canal to control seepage at a rate of 0.10 percent by volume. Concentrations reached 500–800 ppm immediately below application site at this rate. This product contains silicone compounds which apparently form

molecular layers over the gill membranes, thus causing respiratory failure.

* * * * * * *

Estimated 3,000 fish killed as result of gross overdosage of copper sulfate for algae control around water intake. Permit not obtained. Cleared for action for penalty on the fish kill.

* * * * * * *

Seven hundred pounds of a standard application of copper sulfate was applied to lake, killing an estimated 4,500 game fish.

* * * * * * *

Approximately 0.5 mg/1 copper sulfate throughout the lake for several days after treatment. Nearly all fish killed were 10 to 14 inch *Catostomus c. commersonni.* Only one-quarter of lake acreage affected by fish kill which occurred in shoal area not more than 4 feet deep near control dam where copper sulfate "piled up".

* * * * * * *

Lake had heavy algal bloom during week of August 1. Lake treated with 800 lbs. of copper sulfate (23 lbs. per acre) on August 5. High BOD caused almost complete void of dissolved oxygen. Check on August 8, 1961, for D.O. were: surface—0.9 ppm; 4 ft.—0 ppm; 8 ft.—0 ppm; 16 ft.—0 ppm. Fish were observed in distress over major portion of lake. Two truck loads of dead fish, mostly yellow bass, bluegills, largemouth bass, crappie, and carp, were picked up and disposed of. Water temperature: 81° F.

* * * * * * *

Fish kill believed to have been caused by fertilizer plant. An ammonia storage tank was rinsed out after it had been drained, and the rinse water was discharged to the stream.

* * * * * * *

Tentative source of pollution causing 2,000 fish to be killed is laundry waste. Due to physical situation, no toxic conditions found in stream a day after the kill. Waste was not toxic at a 5X dilution, though toxic at a 2X dilution. While laundry waste is suspect, necessary evidence for prosecution not available. To be studied further.

* * * * * * *

Industrial waste containing cyanide caused kill. Corrective action needed: laboratory control of chlorination process for destruction of cyanide. Company promises complete cooperation in preventing recurrence. Recommend penalty for pollution law violation be obtained.

* * * * * * *

Acid wastes from fertilizer manufacturing plant is suspected cause of kill. Periodic kills from this source reported last year. The pH in ditch receiving effluent before flowing into creek was below 3.5. The lowest found in the creek was 6.1. This is below normal.

* * * * * * *

Industrial treatment plant needed. Open sewer lines discharge industrial wastes into river. Water analysis indicated that plant effluent has pH of 1.8. Plant is reputed to discharge in excess of 10,000 gallons of sulfuric acid per week. Also, samples were found to contain amounts of cyanides and copper which would be lethal to fish and aquatic life. One sample from another nearby plant contained as high as 1540 ppm of iron. Other heavy metals, cadmium, zinc, were also found to be present. Worst kill writer has observed in Branford River.

* * * * * * *

Source of toxic material into Clear Creek is from the Crystal Creek tributary. Contractors working on one of the tunnels of the Trinity River project dumped unused concrete into Crystal Creek and allowed tunnel runoff and concrete car wash water to enter this stream.

* * * * * * *

Kill caused by oil running into the canal. It escaped from place where a mosquito control pump was being repaired. This was an unavoidable accident.

* * * * * * *

Several hundred fish were killed from an oil spill from Bunker C. $100 voluntary contribution received. (Editor's note: A separate report listed 53 instances where this State collected $14,599.11 in "voluntary contributions" to pay for the loss of fish.)

* * * * * * *

An accident permitted ammonia to escape into the pond from a chemical industry.

* * * * * * *

Refrigerant from an overturned meat truck entered the lake and killed 3,600 fish. It affected 3 acres of the lake and lasted 7 days.

* * * * * * *

Accidental dumping of 3,000 gallons of stylene plastic into brook, due to break in pipeline, caused a "heavy" kill.

* * * * * * *

The B_____ Hydraulic Co., using chlorine to sterilize a pipeline which crosses over stream, blew off excess at 100 ppm. This caused kill of native brook trout and suckers.

* * * * * * *

The fish kill started below the S_____ sewage treatment plant outfall. It appeared that some toxic material had been discharged to the municipal sewer system and passed through the sewage treatment plant without being removed.

* * * * * * *

An estimated 3,000 to 4,000 fish killed, probably due to combination of low water, high temperature, industrial wastes and sewage.

* * * * * * *

A kill of 50,000 fish resulted from drawdown of sludge digesters. Digesters were emptied to make repairs to heating system.

* * * * * * *

Complete populations of clams, fish, mullet, flounders, crustaceans, crawdads killed. Natural closure of sandbar at river mouth caused standing water receiving sewage to turn septic. Estimated number killed: 10 tons of shellfish, 5 tons of fish, from 1" to 18" in length.

* * * * * * *

Depletion of oxygen in river from sewage outfall killed 23,000 fish. The discharge from this sewage plant has created a problem here for some years during the canning season (August and September). Funds to improve the plant have been requested from State and Federal sources.

* * * * * * *

Waste from tankage manufacturing company killed an estimated 10,000. Complete kill of all aerobic organisms. The affected portion of the stream had no discernible dissolved oxygen content for one week. Below the effluent from the rendering company, the City of M_____ is bypassing raw, untreated sewage into the O_____ River. This situation, the combination of sources, caused fish kills in 1958 and 1959. The City of M_____ is building a new disposal plant. It is not known if the rendering company will utilize this.

* * * * * * *

Believe farmer sprayed field of corn and irrigated immediately afterwards, causing some chemical, believed to be 2,4-D, to wash into the ditch, causing heavy kill.

* * * * * * *

Total kill of 22,000 caused by disposing of old insect spray, toxaphene, in stream above dam. From quantity of toxaphene, we estimated concentration of 85 ppb.

* * * * * * *

Treatment for fire ants with heptachlor granules is in process in T_____ county. Applied at the rate of ¼ pound per acre from airplane. Human and mechanical error responsible for overdose, causing total kill of 1,100 fish in the pond.

* * * * * * *

Complete kill of all fish. Pond stocked with bluegill, red-ear, and largemouth bass. Many waterboatmen and other invertebrates were seen. This type of kill, toxaphene from crop dusting, very common, there being perhaps as many as 50 in the coastal plain per year that we hear about. Insecticides most commonly used are BHC, toxaphene, chlordane, and other chlorinated hydrocarbons.

* * * * * * *

Several gallons of dieldrin were accidentally dumped from a truck on the street in B_____. The material was washed into the river via the storm sewer. Two of the four dead fish analyzed contained 0.5 ppm dieldrin. All fish contained DDT. However, DDT is common in fish in the Yellowstone.

* * * * * * *

A 3-day storm, including 6 inches of early snow, flushed streets, lawns. Storm sewers carried water into lake on overflow. Toxic condition was probably a combination of causes, mostly oil pollution from streets and weed killers from lawns.

* * * * * * *

All fish examined contained DDT and its metabolites from 2.86 to 1.02 ppm. Such levels of this relatively common chlorinated hydrocarbon in fish flesh are not unusual. The possibility of this stored DDT causing death through the effect of an external stimulus is worthy of consideration.

* * * * * * *

Kill caused by an insecticide used for filter fly control. More care must be exercised by sewage treatment plant operators in their use of this toxic

material on filters. This insecticide contains both malathion and dieldrin.

* * * * * *

Specific cause was 6 percent DDT, applied at ⅓ lb. or 1 gal/acre as mosquito larvicide. Moderate kill of common killifish, *Fundulus*, *Heteroclitus*, *Macrolepidotus*, and light kill of threespined sticklebacks, *Gasterosteus aculeatus*. Changes otherwise unknown except close to 100 percent kill of mosquito larvae observed. Seagulls made counts and severity estimates difficult and of dubious value. However, many live fish remain. Two "sand eels" dead. DDT applied without required Water Pollution Commission authorization. Applicator being warned and reproved.

* * * * * *

Endrin spray caused a heavy kill of 2,000 lbs. of forage fish. Endrin sprayed on tobacco plants on hill and about ¼ mile above the lakes was flushed into these waters by a 4-inch rainfall that occurred within a few hours after spraying. This caused a very heavy mortality of carp and buffalo in these lakes.

* * * * * *

Insecticides suspected, not known whether washed off fields during a flash flood or introduced otherwise. This was a severe kill of several tons of fish in a 35-mile stretch of the river.

* * * * * *

Dirt excavated around an exceptionally large poultry farm, and believed to contain chemicals used to control such poultry diseases as the gapes, etc., spilled into brooks. Faint odor of chlordane.

* * * * * *

Application of a weedicide to irrigation canals killed estimated 12,700 fish. Most crayfish and some clams destroyed for 3 miles with less kill below. Weedicide supplied to 3 canals at 44 ppm each. Canals spilled to main river which was flowing only 50 cfs; water temperature of river 82° F.

* * * * * *

Liquid wastes from potato plant caused drop in dissolved oxygen to less than 1 ppm, killing an estimated 100,000 fish. A repeat of last year's problem, only at an earlier date this year. The potato processing plants located on the bank of the Snake River near the city of B___ have done very little so far in reducing their flow of organic wastes into the river.

* * * * * *

A valve on the discharge line of a canning company lagoon was opened and some of the waste from the lagoon was discharged into the stream. The waste depleted the stream of dissolved oxygen and the fish were killed.

* * * * * *

During the week of September 4, 1961, wastes from the sorghum plant were discharged into the stream. The wastes depleted the stream of dissolved oxygen and the fish died. Following our engineer's recommendations, the wastes are now being dispoeed of by tank truck.

* * * * * *

A conveyor broke down at a tomato packing plant and the wastes which normally were discharged into a truck and hauled away were discharged into the plant sewer system. The system in turn discharged into the municipal sewer system. The wastes depleted the stream of dissolved oxygen causing the fish to die.

* * * * * *

The plant extracts oil from soybeans. It is believed that some of the oil boiled over with the condensate and was discharged to the stream. The oil has a BOD of approximately 500,000 ppm and breaks down very slowly. The stream was depleted of dissolved oxygen and fish were killed.

* * * * * *

Overflow from a manure pit depleted the stream of dissolved oxygen causing the fish to die. Upon recommendation of our representative, the farmer stopped the discharge from the manure pit to the creek.

* * * * * *

Lagoon dike broke, allowing milk plant wastes with BOD of 1,780 ppm to discharge to stream in a slug, killing all fish in its path. Corrective action needed: strengthen dike and consider other means of waste disposal.

* * * * * *

Kill occurred only in limited area behind impounding dam. Caused by extreme drawdown during dam repairs and accumulated sludge from paper wastes. DO's down to 0.4 ppm. Fish killed were chiefly suckers and probably about the only fish life in the area at the time.

* * * * * *

PHS–3327
REV. 8-60

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

(WASHINGTON USE)

Form Approved: Budget Bureau No. 68–R706

REPORT OF POLLUTION-CAUSED FISH KILL

1. LOCATION:
   Stream or Lake .....
   Nearest Town ..... State .....
2. DATE OF KILL: .....
3. TYPE WATER: ☐ Fresh ☐ Salt ☐ Estuary
4. SOURCE OF POLLUTION:
   ☐ Mining Operations ☐ Agricultural Poisons ☐ Domestic Sewage
   ☐ Industrial Wastes ☐ Other ..... ☐ Unknown
   Specific cause if known .....
5. TYPE OF FISH KILLED
   ..... % Game
   ..... % Forage
   ..... % Rough or Trash
   100%
6. ESTIMATED NUMBER KILLED .....
7. SEVERITY:
   ☐ Total ☐ Heavy ☐ Moderate ☐ Light
8. EXTENT: Miles of stream or acres of lake affected .....
9. DURATION OF CRITICAL EFFECT: ..... days ..... hrs.

(Fold Here)

10. SIGNIFICANT CHANGES IN AQUATIC FOOD ORGANISMS .....
    .....
    .....
    .....
11. CORRECTIVE ACTION NEEDED .....
    .....
    .....
12. COMMENTS .....
    .....
    .....
    .....

REPORTING OFFICIAL	AGENCY MAILING ADDRESS	DATE

FIGURE 1

1951

TABLE 1—*Pollution-caused fish kill summary by State*

	Number of reports	Reporting number of fish killed		Extent of damage					
		Number of reports	Number of fish	Miles of river		Acres of lake		Miles of shore	
				Number reports	Miles	Number reports	Acres	Number reports	Miles
Alabama	1	1	200,000	1	120				
Arizona	1		(*)	1	4				
Arkansas	2		(*)	1	2	1	3		
California	33	30	743,870	5	28	26	3,766		
Colorado	1	1	30,000			1	20		
Connecticut	6	4	1,700	2	3				
Florida	8	4	63,575	2	21	1	2	2	8
Georgia	5	2	11,500	1	1	1	5		
Hawaii	3	3	1,175			1	30		
Idaho	1	1	100,000	1	3				
Illinois	27	25	5,612,362	17	110			2	10
Indiana	20	7	40,895	16	69	1	3		
Iowa	18	9	42,300	9	208	1	25		
Kansas	4		(*)	1	25				
Kentucky	7	2	2,250	6	31				
Louisiana	25	9	24,800	24	136	1	5		
Maine	7	2	2,600	5	6	1	600		
Maryland	4	2	26,000	2	8	1	25		
Massachusetts	2		(*)	1	3				
Michigan	6	6	9,962	1	6				
Minnesota	6	1	7,000	6	24				
Mississippi	1		(*)	1	15				
Missouri	11	10	51,300	7	54	2	7		
Montana	7	4	2,388	5	69				
Nebraska	1		(*)	1	1				
New Hampshire	7	5	5,650	2	7	3	1,070		
New Jersey	4		(*)	2	4				
New Mexico	3	1	4,500	2	21	1	18		
New York	27	20	33,000	12	33	2	6		
North Carolina	7	3	5,053,000	3	40				
North Dakota	3	1	22,000	1	40	1	86		
Ohio	31	25	78,413	16	35				
Oregon	5	3	17,300	5	40				
Pennsylvania	70	58	1,187,498	49	205				
Rhode Island	1	1	200						
South Carolina	2		(*)	1	2				
South Dakota	1		(*)	1	40				
Tennessee	5	3	1,255,500	3	5	1	200		
Texas	6		(*)	6	40				
Utah	2	2	43,000					2	33
Virginia	15	10	205,775	8	72	3	69		
Washington	5	2	2,100	4	4				
West Virginia	6	4	24,500	6	143				
Wisconsin	3	2	12,000	2	6	1	27		
Wyoming	1		(*)	1	2				
United States total	411	263	14,918,113	240	1,686	50	5,967	6	51

*Number of fish not reported (see page 2).

TABLE 2.—*Fish kill summary by source of pollution*

Source of pollution	Number of Reports	Reporting number of fish	
		Number of Reports	Number of fish
Mining operations	19	16	1, 085, 685
Agricultural poisons	75	44	5, 645, 198
Domestic sewage	52	29	162, 335
Industrial wastes	159	113	2, 859, 005
Other sources	60	35	184, 232
Unknown	79	51	5, 763, 768
Total	444	289	[1] 14, 918, 113

[1] Adds to 15,700,223 because of 782,110 fish reported from more than one source.

TABLE 3.—*Estimated average size of kill and number killed by source of pollution*

Source of pollution	1960	1961	
	Estimated [1] average size of kill	Estimated [1] average size of kill	Estimated number [2] killed
Mining operations	1, 775	5, 710	1, 103, 000
Agricultural poisons	2, 285	5, 990	5, 831, 000
Domestic sewage	2, 830	5, 600	291, 000
Industrial wastes	3, 950	7, 115	3, 186, 000
Other	1, 910	5, 265	316, 000
Unknown	2, 990	7, 470	5, 965, 000
Total	2, 925	6, 535	[3] 16, 692, 000

[1] Adjusted to exclude reports showing 100,000 or more fish killed.
[2] Includes all fish killed as reported plus the average number killed for each source applied to those reports where no actual number was given.
[3] This figure includes 782,000 from more than one source of pollution.

TABLE 4.—*Estimated percentage distribution of fish killed by type*

	1960			1961		
	Game	Forage	Rough	Game	Forage	Rough
Mining operations	19. 9	74. 9	5. 2	14. 8	68. 6	16. 6
Agricultural poisons	46. 6	24. 9	28. 5	3. 0	94. 1	2. 9
Domestic sewage	4. 2	5. 6	90. 2	20. 2	35. 9	43. 9
Industrial wastes	5. 6	20. 2	74. 2	9. 0	46. 7	44. 3
Other sources	37. 7	24. 2	38. 1	37. 8	46. 7	15. 5
Unknown	20. 9	36. 9	42. 2	0. 2	99. 4	0. 4
Total	7. 0	22. 0	71. 0	4. 9	83. 3	11. 8

TABLE 5—*Estimated number of fish killed by type by source of pollution*

Source	Game	Forage	Rough or trash
Mining operations	163, 000	757, 000	183, 000
Agricultural poisons	175, 000	5, 487, 000	169, 000
Domestic sewage	58, 000	105, 000	128, 000
Industrial wastes	287, 000	1, 488, 000	1, 411, 000
Other sources	119, 000	148, 000	49, 000
Unknown sources	12, 000	5, 929, 000	24, 000
Total	814, 000	13, 914, 000	1, 964, 000

TABLE 6.—*Fish kill summary by type of water body*

Type of water	Number of reports	Reporting number of fish		Extent of damage					
		Number of reports	Number of fish	Miles of river		Acres of lake		Miles of shore	
				Number reports	Miles	Number reports	Acres	Number reports	Miles
River	340	199	12, 642, 752	240	1, 686				
Lake	42	37	1, 532, 491			24	2, 149	5	48
Bay	29	26	742, 870			26	3, 818	1	3
Total	411	263	14, 918, 113	240	1, 686	50	5, 967	6	51

TABLE 7.—*Fish kill summary by type of water*

Type of water	Number of reports	Reporting number of fish	
		Number of reports	Number of fish
Fresh	375	234	9, 022, 243
Salt	26	24	689, 370
Brackish	10	5	5, 206, 500
Total	411	263	14, 918, 113

TABLE 8.—*Response as to whether pollution caused significant changes in aquatic food organisms*

Source of pollution	Yes	No	Not stated	Total
Mining operations	3	1	15	19
Agricultural poisons	15	2	58	75
Domestic sewage	7	1	44	52
Industrial wastes	32	9	118	159
Other sources	20		40	60
Unknown	5	7	67	79
Total	82	20	342	444

TABLE 9.—*Response as to whether a specific corrective action was recommended*

Source	Yes	"None needed"	Not stated	Total
Mining operations	15		4	19
Agricultural poisons	46	2	27	75
Domestic sewage	32		20	52
Industrial wastes	108		51	159
Other sources	37	2	21	60
Unknown	26	2	51	79
Total	264	6	174	444

TABLE 10.—*Response as to severity of kill*

Source	Total kill	Heavy kill	Moderate kill	Light kill	Not stated	Total
Mining operations	5	5	6	2	1	19
Agricultural poisons	12	41	11	9	2	75
Domestic sewage	7	14	15	11	5	52
Industrial wastes	20	60	43	24	12	159
Other sources	13	16	11	11	9	60
Unknown	6	25	21	21	6	79
Total	63	161	107	78	35	444

TABLE 11.—*Response as to whether a specific causative agent was named*

Source	Yes	Not stated	Total
Mining operations	14	5	19
Agricultural poisons	31	44	75
Domestic sewage	52	------	52
Industrial wastes	86	73	159
Other sources	41	19	60
Unknown	6	73	79
Total	230	214	444

TABLE 12.—*Response as to duration of critical effect of pollution kill*

Source	Yes	Not stated	Total
Mining operations	19	0	19
Agricultural poisons	59	16	75
Domestic sewage	33	19	52
Industrial wastes	121	38	159
Other sources	41	19	60
Unknown	53	26	79
Total	326	118	444

TABLE 13.—*Response as to giving geographic extent of kill*

Source	Yes	Not stated	Total
Mining operations	17	2	19
Agricultural poisons	57	18	75
Domestic sewage	35	17	52
Industrial wastes	121	38	159
Other sources	43	17	60
Unknown	53	26	79
Total	326	118	444

TABLE 14.—*Response as to indicating types of fish killed*

Source	Yes	Not stated	Total
Mining operations	18	1	19
Agricultural poisons	72	3	75
Domestic sewage	40	12	52
Industrial wastes	134	25	159
Other sources	52	8	60
Unknown	62	17	79
Total	378	66	444

TABLE 15.—*Fish kill summary by date of kill*

Month	Number of reports	Reporting number of fish	
		Number of reports	Number of fish
January	16	9	30, 696
February	17	9	70, 041
March	16	9	15, 833
April	16	9	64, 228
May	34	21	473, 846
June	64	40	166, 497
July	84	56	228, 786
August	60	38	5, 647, 091
September	57	36	413, 206
October	23	16	6, 365, 732
November	16	13	1, 417, 207
December	8	7	24, 950
Total	411	263	14, 918, 113

TABLE 16.—*Frequency distribution of reported duration of critical effect.*

(Number of Reports Showing Kills Lasting Indicated Number of Days)

Days	Mining operations	Agricultural poisons	Domestic sewage	Industrial wastes	Other sources	Unknown	Total
<1	----------	5	1	10	6	8	30
1	4	37	9	54	11	31	146
2	5	8	14	30	7	6	70
3	3	3	2	11	8	5	32
4	1	1	----------	2	----------	1	5
5	----------	----------	1	1	1	1	4
6	----------	1	----------	1	----------	1	3
7	2	2	----------	6	3	----------	13
8	----------	----------	----------	----------	1	----------	1
9	----------	1	----------	----------	----------	----------	1
10	3	1	3	2	2	----------	11
14	1	----------	----------	----------	----------	----------	1
15	----------	----------	1	1	----------	----------	2
18	----------	----------	1	----------	1	----------	2
20	----------	----------	----------	1	----------	----------	1
21	----------	----------	----------	1	----------	----------	1
30	----------	----------	1	----------	----------	----------	1
35	----------	----------	----------	----------	1	----------	1
60	----------	----------	----------	1	----------	----------	1
Total	19	59	33	121	41	53	326

TABLE 17.—*Percentage of definite responses to selected questions*

Source	Number killed	Specific agent	Type of fish	Severity of kill	Miles affected	Duration of effect	Food change	Corrective action
Mining operations	84	74	95	95	89	100	21	79
Agricultural poisons	59	41	96	97	76	79	23	64
Domestic sewage	56	100	79	90	67	63	15	62
Industrial wastes	77	54	84	92	76	76	26	68
Other sources	58	68	87	85	72	68	33	65
Unknown	65	8	78	91	67	67	15	35
Total	65	93	85	92	73	73	23	61
Ratio of Percentages—1961 to 1960								
Mining operations	168	82	106	119	111	125	35	75
Agricultural poisons	148	48	105	104	112	122	33	88
Domestic sewage	112	100	101	90	83	121	68	87
Industrial wastes	135	82	102	99	93	127	87	110
Other sources	109	85	114	96	118	103	97	86
Unknown	105	80	92	101	89	87	68	44
Total	125	150	101	100	96	112	58	105

REPORT OF POLLUTION-CAUSED FISH KILLS
CUMULATIVE LISTING OF REPORTS RECEIVED AS OF DATE OF TABULATION

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	ALLEGED CAUSE OF KILL: MUNICIPAL SEWAGE (1)	INDUSTRIAL WASTES (2)	OTHER (3)	UNKNOWN (4)	TYPE OF FISH KILLED (PERCENT): GAME	FORAGE	TOUGH	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT: DA.	HR.
ALABAMA																			
COOSA RIVER	ANNISTON	9	14	61			4		20	40	40	200,000		2			120M	21	-
ARIZONA																			
GILA GRAVITY CAN	YUMA	10	26	61				5	40	60	0	-			3		4M	5	-
ARKANSAS																			
BIG BAYOU	DERMOTT	9	22	61	2				5	60	35	-		2			2M	4	-
BRADFORDS LAKE	HERSELEY	1	8	61				6	90	10	0	-		2			3A	6	-
CALIFORNIA																			
												18,000		2			8M	35	-
TRUCKEE RIVER	AL TAHOE	2	3	61				5	40	0	60	500	1				50A	-	-
BUENA VISTA LAG	CARLSBAD	8	4	61		3			0	0	100	-	1				600A	10	-
TIA JUANA RIVER	IMPERIAL	7	24	61		3		5	70	20	10	-			3		4M	3	-
SAN JOAQUIN RIV	MANTECA	6	3	61				6	95	0	5				3		7M	1	-
SAN JOAQUIN RIV	PATTERSON	8	6	61		3			40	0	60	23,000					-	2	-
SACRAMENTO RIVER	REDDING	8	6	61					100	0	0	30	1				3M	18	-
CLEAR CREEK	REDDING	2	2	61	1				10	10	80	-					6M	-	6
KINGS RIVER	REEDLEY	8	3	61			5		10	0	90	12,700		2			7A	1	-
LOS ANGELES HARB	SAN PEDRO	6	7	61		2			13	0	87	2,220			3		153A	1	-
LOS ANGELES HARB	SAN PEDRO	6	21	61				4	0	100	0	2,820			3		300A	1	-
LOS ANGELES HARB	SAN PEDRO	7	19	61				4	0	100	0	33,900		2			300A	1	-
LOS ANGELES HARB	SAN PEDRO	7	21	61				4	1	99	0	22,830		2			153A	1	-
LOS ANGELES HARB	SAN PEDRO	7	29	61				4	-			99,810		2			160A	1	-
LOS ANGELES HARB	SAN PEDRO	8	3	61				4	0	100	0	6,100				4	153A	1	-
LOS ANGELES HARB	SAN PEDRO	8	7	61				4	0	100	0	850				4	100A	1	-
LOS ANGELES HARB	SAN PEDRO	8	10	61				4	0	100	0	930				4	153A	1	-
LOS ANGELES HARB	SAN PEDRO	8	14	61				4	0	100	0	5,930			3		150A	1	-
LOS ANGELES HARB	SAN PEDRO	8	16	61				4	0	100	0	6,190			3		150A	1	-
LOS ANGELES HARB	SAN PEDRO	8	17	61				4	0	100	0	2,420			3		150A	1	-
LOS ANGELES HARB	SAN PEDRO	8	25	61				4	0	100	0	2,900			3		100A	1	-
LOS ANGELES HARB	SAN PEDRO	8	30	61				4	0	100	0	9,410			3		150A	1	-
LOS ANGELES HARB	SAN PEDRO	9	6	61				4	0	100	0	26,360		2			150A	1	-
LOS ANGELES HARB	SAN PEDRO	9	11	61				4	0	100	0	120,200		2			125A	1	-
LOS ANGELES HARB	SAN PEDRO	9	19	61				4	0	100	0	38,300		2			125A	1	-
LOS ANGELES HARB	SAN PEDRO	9	22	61				4	0	100	0	9,800				4	125A	1	-
LOS ANGELES HARB	SAN PEDRO	9	26	61				4	0	100	0	940				4	133A	1	-
LOS ANGELES HARB	SAN PEDRO	10	3	61				4	0	100	0	277,860		2			133A	1	-
LOS ANGELES HARB	SAN PEDRO	10	16	61				4	0	100	0	56,230			3		7A	1	-
LOS ANGELES HARB	SAN PEDRO	10	19	61				4	0	100	0	5,000				4	7A	1	-
LOS ANGELES HARB	SAN PEDRO	10	26	61				4	0	100	0	510				4	7A	1	-
LOS ANGELES HARB	SAN PEDRO	11	1	61				4	0	100	0	150				4	-	-	-
LOS ANGELES HARB	SAN PEDRO	11	6	61				4	100	0	0	250					123A	1	-
MORELUPNE RIVER	WEST POINT	4	29	61	2		4		0	45	55	1,710		2					
LOS ANGELES HARB	WILMINGTON	9	29	61															
COLORADO																			
ROCKY MOUNT LAKE	DENVER	9	1	61	2			6	20	50	30	30,000		2			20A	3	-
CONNECTICUT																			
												-		2			-	1	-
BRANFORD RIVER	BRANFORD	6	19	61			4		10	80	10	1,000		2			-	2	-
FRESHWATER BROOK	HAZARDVILLE	8	21	61	2				1	14	85	180	1				1M	1	-
RINDGE BROOK	SEYMOUR	9	21	61	2				100	0	0	400			3		2M	-	12
QUINNIPIAC RIVER	SOUTHINGTON	9	9	61			4		0	0	100	200		2			-	3	-
HEMLOCK TRAIL BR	TRUMBULL	4	10	61			4		90	0	90	-		2			-	-	10
FRESHWATER BROOK	THOMPSONVILLE	4	28	61				5	0	10	0								
FLORIDA																			
												-		2			15M	-	12
ESCAMBIA RIVER	CENTURY	8	15	61				4	25	0	75	-					-	1	-
N PT COMFORT CAN	ENGLEWOOD	10	6	61				5	-			75		2			6M	-	8
OCHLOCKONEE RIV	HAVANA	11	27	61				6	95	0	5	-					3M	-	-
LYNN HAVEN BAYOU	LYNN HAVEN	9	23	61	2			6	10	40	30	50,000	1				2A	4	-
SHELL PIT	NEW SMYRNA BCH	3	26	61				6	-			3,300	1				3M	1	-
BAYOU CHICO	PENSACOLA	1	10	61			4		100	0	0	10,000		2			-	-	-
CANAL 78TH AVE N	ST PETERSBURG	7	9	61				6	-			-		2			-	1	-
TAMPA BAY	TAMPA	9	14	61				6	-			-				3			

REPORT OF POLLUTION-CAUSED FISH KILLS
CUMULATIVE LISTING OF REPORTS RECEIVED AS OF DATE OF TABULATION

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	IMPUTED CAUSE OF KILL: MUNICIPAL OPERATIONS (110)	AGRICULTURAL (120)	DOMESTIC SEWAGE (130)	INDUSTRIAL WASTES (140)	OTHER (150)	UNKNOWN (160)	TYPE OF FISH KILLED (PERCENT): GAME (1)	FORAGE (2)	TRASH (3)	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (10)	HEAVY (20)	MODERATE (30)	LIGHT (40)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT: DA.	MI.
GEORGIA																					
TURTLE RIVER	BRUNSWICK	3	18	61				4			50	25	25	-		2			-	1	-
GUM CREEK	CORDELE	8	—	61				4			10	75	15	1,500			3		-	1	-
GUM CREEK	CORDELE	8	7	61				4			-			-		2			-	-	-
OCHLOCKNEE RIVER	MOULTRIE	7	28	61				4			75	20	5	10,000	1				1M	7	-
JOHNSON CO LAKE	SANDERSVILLE	6	20	61		2					-			-		2			5A	-	-
HAWAII																					
WAIAKEA MILL PND	HILO	11	2	61						6	0	100	0	100				4	30A	-	-
WILSON LAKE	WAHIAWA	11	18	61						6	25	50	25	1,000				4	-	-	-
WAHIAWA RESVR	WAHIAWA	12	13	61						6	25	50	25	75				4	-	-	-
IDAHO																					
MILNER RESVR	BURLEY	11	8	61				4			2	6	92	100,000	1				3M	20	-
ILLINOIS																					
KASKASKIA RIVER	ALLENVILLE	2	12	61						6	23	2	75	2,196			3		-	2	-
KISHWAUKEE RIVER	BELVIDERE	8	4	61						6	5	85	10	6,496			3		4M	-	12
BIG ROCK CREEK	BIG ROCK	7	30	61			3				12	23	65	1,760			3		-	2	-
DROWNING FORK CR	BUSHNELL	8	28	61			3				6	58	36	14,993		2			-	2	-
MACKINAW RIVER	COLFAX	7	6	61		2					7	43	50	9,662		2			2M	1	-
ILLINOIS RIVER	CREVE COUER	8	1	61		2					2	96	2	5,807,980		2			26M	-	-
VERMILION RIVER	DANVILLE	9	8	61					5		1	97	2	11,471		2			3M	2	-
BIG INDIAN CREEK	EARLVILLE	8	30	61						6	3	36	61	19,729		2			2M	1	12
BLACKBERRY CREEK	ELBURN	9	2	61						6	1	40	59	2,323		2			2M	-	12
HORSESHOE LAKE	GRANITE CITY	4	26	61				4			2	2	96	10,189			3		7M	5	-
HORSESHOE LAKE	GRANITE CITY	8	24	61				4			22	78	0	3,177			3		-	-	-
HORSESHOE LAKE	GRANITE CITY	11	4	61				4			9	70	21	11,521			3		-	6	-
S FK SANGAMON R	KINCAID	7	20	61	1						22	78	0	2,784				4	17M	2	-
STRADDLE CREEK	LANARK	9	2	61					5		1	98	1	29,690			3		4M	3	-
PINE CREEK	MT MORRIS	7	20	61					5		12	67	21	37,876		2			7M	2	-
WIDE WATERS	OTTAWA	9	13	61	1						5	89	6	6,648			3		3M	2	-
DUPAGE RIVER	PLAINFIELD	6	—	61				4			-			400		2			-	-	-
DUPAGE RIVER	PLAINFIELD	6	8	61			3	4			3	30	67	6,894			3		15M	2	-
DES PLAINES RIV	RIVERSIDE	6	9	61			3				14	0	86	149				4	2M	2	-
SUGAR CREEK	SPRINGFIELD	7	20	61						6	33	28	39	489				4	1M	2	-
SUGAR CREEK	SPRINGFIELD	8	19	61			3				84	13	3	360				4	4M	2	-
ROCK RIVER	STERLING	8	21	61				4			65	8	27	1,263			3		1M	-	9
ROCK RIVER	STERLING	9	3	61			3		5		0	100	0	-		2			13M	3	-
VERMILION RIVER	STREATOR	1	11	61						6	4	6	90	-			3		3M	-	-
INDIAN CREEK	TOULON	6	6	61			3				19	67	14	2,193			3		-	-	15
BIG MUDDY CREEK	W FRANKFORT	6	7	61	1						11	0	89	9,543			3		4M	2	-
FOX RIVER	YORKVILLE	9	18	61			3	4			21	46	33	31,334		2			-	2	-
INDIANA																					
HINKLE CREEK	BAKERS CORNERS	9	13	61				4			-			-		2			1M	7	-
LICK CREEK	BEECH GROVE	12	4	61						6	-			75				4	-	1	-
ST MARYS RIVER	DECATUR	7	20	61						6	-			-		2			20M	2	-
ST MARYS RIVER	DECATUR	8	16	61				4			-			-			3		10M	2	-
YOUNGS CREEK	FRANKLIN	8	30	61			3				-			-		2			5M	1	-
BIG MINOR DITCH	FRANCESVILLE	7	17	61		2		4			50	30	20	10,000		2			-	2	-
MINOR DITCH	FRANCESVILLE	7	17	61				4			-			-		2			7M	1	-
WOLF LK CHANNEL	HAMMOND	5	4	61				4			-			10,000		2			1M	1	-
COUNTY DITCH	HOBBS	9	28	61				4			-			-				4	3M	3	-
CROOKED CREEK	INDIANAPOLIS	1	7	61						6	-			500			3		1M	2	-
FALL CREEK	INDIANAPOLIS	7	15	61			3				-			-			3		2M	1	-
KOKOMO CREEK	KOKOMO	10	18	61				4			-			500			3		1M	2	-
EEL RIVER	LOGANSPORT	6	15	61					5		-			20				4	-	-	1
MUSCATATUCK RIV	NORTH VERNON	9	25	61						6	-			-				4	1M	1	-
LITTLE DEER CR	ONWARD	9	28	61					5		-			-			3		7M	2	-
AL CREEK	PORTLAND	8	16	61					5		-			-			3		3M	7	-
EAGLE CREEK	SPEEDWAY	9	9	61						6	-			-		2			3M	-	12
L MISSISSINEWA R	UNION CITY	9	16	61				4			-			-			3		3M	-	12
MUSCATATUCK RIV	VALLONIA	9	4	61						6	-			-				4	1M	-	6
WOLF LAKE	WHITING	5	2	61				4			98	0	2	20,000		2			3A	10	-

REPORT OF POLLUTION-CAUSED FISH KILLS
CUMULATIVE LISTING OF REPORTS RECEIVED AS OF DATE OF TABULATION

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	IMPUTED CAUSE OF KILL: MUNICIPAL OPERATIONS (1)	AGRICULTURAL, INDUSTRIAL, DOMESTIC WASTES (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	TYPE OF FISH KILLED * (PERCENT): GAME	PANFISH	TRASH	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT: DA.	HR.
IOWA																					
ALBIA RESVR	ALBIA	8	7	61					5		98	0	2	12,000		2			25A	2	-
MILL CREEK	CLINTON	9	6	61				4			5	70	25	250				-	3M	-	-
RODAWAY RIVER	CORRING	8	9	61			3				10	0	90	1,000			3		-	2	-
CEDAR CREEK	FAIRFIELD	2	12	61			3				5	0	95	-		2			7M	-	-
PLUM CREEK	FREDERICKSBURG	6	5	61					5		0	100	0	1,000		2			4M	-	-
UNNAMED CREEK	FT MADISON	7	—	61				4			10	10	80	-		2			-	-	-
WILLOW SLOUGH	HENDERSON	7	24	61					5		100	0	0	29,000	1				150M	-	-
UNNAMED CREEK	INDEPENDENCE	1	1	61			3				0	100	0	-				-	-	18	-
MISSISSIPPI RIV	KEOKUK	3	—	61			3	4			10	30	60	-				4	1M	-	-
MISSISSIPPI RIV	KEOKUK	4	—	61			3	4			20	10	70	-			3		2M	-	-
SKUNK RIVER	MAHASKA CO	7	2	61		2					10	10	80	-		2			35M	1	-
MILL CREEK	MAQUOKETA	4	—	61					5		0	90	10	-			3		-	-	-
WINNEBAGO RIVER	MASON CITY	6	26	61				4			5	0	95	2,000				-	-	-	-
NORTH COLYN LAKE	RUSSELL	8	23	61						6	100	0	0	150				4	-	1	-
BUCK CREEK	RYAN	5	28	61					5		5	95	0	-		2			9M	-	-
LITTLE SIOUX RIV	SPENCER	7	19	61			3				2	60	38	300				4	-	5	-
RACCOON RIVER	STORM LAKE	9	8	61						6	10	40	50	600				-	-	-	-
OTTER CREEK	WEST UNION	5	14	61						6	20	80	0	-			3		1M	-	-
KANSAS																					
ARKANSAS RIVER	DODGE CITY	6	11	61					5		15	20	65	-		2			25M	-	18
W BR WALNUT RIV	ELDORADO	6	14	61				4			10	15	75	-	1				-	-	-
KANSAS RIVER	LAWRENCE	1	5	61				4			10	10	80	-			3		-	-	-
SPRING CREEK	WAKEENEY	5	12	61		2					5	95	0	-			3		-	-	-
KENTUCKY																					
BEECH FORK CREEK	BARDSTOWN	9	26	61					5		5	15	80	2,000		2			-	2	-
SO FK BEAVER CR	GLASGOW	8	31	61			3				20	30	50	-		2			3M	2	-
BEAVER CREEK	GLASGOW	8	26	61			3				30	10	60	-		2			5M	2	-
BULLSKIN CREEK	MANCHESTER	5	30	61	1						-			-					1M	1	-
RED BIRD RIVER	MANCHESTER	6	3	61				4			12	70	18	-		2			2M	-	-
L/BIG GOOSE CR	MANCHESTER	10	11	61	1						5	10	85	-			3		3M	10	-
CUMBERLAND RIVER	STEARNS	5	—	61	1						100	0	0	250				4	15M	1	-
LOUISIANA																					
INTER COAST CAN	CUT OFF	6	22	61		2					10	60	30	-		2			2M	1	-
PIERRE PORT BAYO	DONALDSONVILLE	7	24	61		2					20	60	20	2,500		2			7M	1	-
PIERRE PORT BAYO	DONALDSONVILLE	8	1	61		2					15	80	5	-		2			5M	1	-
SHELL CANAL	GIBSON	9	26	61		2					15	70	15	-		2			3M	1	-
GRAND CAILLOU BU	HOUMA	7	7	61		2					15	60	25	-			3		3M	1	-
OUT FALL CANAL	HOUMA	7	8	61		2					10	70	20	-		2			10M	1	-
BAYOU BLACK	HOUMA	7	11	61		2					10	70	20	1,000		2			8M	1	-
MORGANS CANAL	HOUMA	7	11	61		2					5	75	20	500		2			2M	1	-
HANSON CANAL	HOUMA	7	28	61		2					15	75	10	-		2			2M	1	-
WERNER CANAL	HOUMA	7	28	61		2					10	80	10	-		2			5M	1	-
BAYOU BLACK	HOUMA	7	28	61		2					10	70	20	-		2			5M	1	-
BLIND RIVER	LUTCHER	7	14	61		2					20	60	20	-		2			5M	1	-
CANCIENNE CANAL	NAPOLEONVILLE	7	2	61		2					10	60	30	-		2			15M	1	-
LAKE NATCHEZ	NAPOLEONVILLE	7	14	61		2					20	70	10	5,000		2			7M	1	-
PETIT PRAIRIE BU	PALMETTO	7	21	61		2					30	50	20	-		2			8M	1	-
CHOCTAW BAYOU	PORT ALLEN	8	3	61		2					10	80	10	-		2			5M	2	-
CANAL HWY 645	RACELAND	7	8	61		2					15	60	25	8,000		2			5M	1	-
FORET CANAL	THIBODAUX	6	22	61		2					10	60	30	-		2			5M	1	-
LAKE BOEUF	THIBODAUX	7	13	61		2					15	75	10	1,000		2			5A	1	-
GRAND BAYOU	THIBODAUX	7	15	61		2					10	70	20	3,000		2			3M	1	-
CHEVRIEUL BAYOU	THIBODAUX	7	16	61		2					15	75	10	3,000		2			3M	1	-
ASHLAND CANAL	THIBODAUX	9	—	61		2					10	70	20	-		2			10M	1	-
FORET CANAL	THIBODAUX	9	26	61		2					10	70	20	-		2			10M	1	-
FOLSES BR CANAL	WHITE CASTLE	7	14	61		2					10	80	10	800		2			3M	1	-
WHITE CASTLE CAN	WHITE CASTLE	7	14	61		2					15	60	25	-		2			3M	1	-
MAINE																					
ROUND POND	CHARLOTTE	7	1	61						6	10	90	0	2,500				4	600A	-	-
BRANCH BROOK	DURHAM	7	—	61		2					10	70	20	100				-	2M	-	-
MCDONALD BROOK	FT FAIRFIELD	9	14	61		2					95	5	0	-	1				1M	-	12
B STREAM	HOULTON	7	—	61		2					20	80	0	-			3		-	7	-
BIG BROOK	LITTLETON	7	—	61		2					75	25	0	-			3		1M	-	-
HUNTLEY BROOK	MERRILL	7	—	61		2					85	15	0	-			3		1M	2	-
KELLY BROOK	ST FRANCIS	7	—	61		2					100	0	0	-		2			1M	1	-

REPORT OF POLLUTION-CAUSED FISH KILLS
CUMULATIVE LISTING OF REPORTS RECEIVED AS OF DATE OF TABULATION

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL						TYPE OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	SEWAGE TREATMENT (1)	AGRICULTURAL CHEMICAL-TYPICAL POISONS (2)	DOMESTIC SEWAGE (3)	INDUSTRIAL WASTES (4)	OTHER (5)	UNKNOWN (6)	GAME	FORAGE	TRASH		TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA.	HR.
MARYLAND																					
N BR PATAPSCO R	CARROLLTON	9	23	61				5			-			-				-	6M	1	-
HIGGINS MILL	LINKWOOD	2	12	61			4				40	60	0	25,000			3		25A	3	-
ISRELS CR	WALKERSVILLE	4	22	61						6	0	0	100	-	1				-	-	-
N BR PATAPSCO R	WESTMINSTER	1	11	61			4				0	50	50	1,000	1				2M	2	-
MASSACHUSETTS																					
CHICOPEE RIVER	CHICOPEE	8	20	61			3	4			0	0	100	-			3		3M	1	-
WARE RIVER	HARDWICK	9	2	61				4			0	0	100	-			3		-	2	-
MICHIGAN																					
SWAN CREEK	BRONSON	2	17	61				4			10	0	90	3,645			3		-	2	-
CASS RIVER	CASS CITY	1	16	61				4			5	0	95	166				-	-	-	-
COOLEY LAKE	COMMERCE	7	8	61					5		100	0	0	700				4	-	-	-
RED CEDAR RIVER	FOWLERVILLE	5	14	61				4			4	36	60	690		2			6M	1	-
ROUND LAKE	LAINGSBURG	6	6	61		2					100	0	0	4,241			3		-	-	-
CRESCENT LAKE	PONTIAC	7	1	61		2					100	0	0	520				4	-	1	-
MINNESOTA																					
ST LOUIS RIVER	CARLTON	7	17	61				4			0	0	100	-	1			-	4M	-	-
POPPLE RIVER	FOSSTON	6	9	61				4			-			-				-	7M	-	-
MISSISSIPPI RIV	HASTINGS	9	3	61			3				-			-				-	2M	-	-
ZUMBRO RIVER	MANTORVILLE	2	8	61				4			-			-				-	4M	-	-
SAUK RIVER	MELROSE	3	27	61			3	4			-			-	1				6M	-	-
BIG SPRING CREEK	PRESTON	8	31	61		2					1	0	99	7,000		2			3M	2	-
MISSISSIPPI																					
PEARL RIVER	PHILADELPHIA	9	16	61				4			-			-		2			15M	3	-
MISSOURI																					
MONEGAW CREEK	APPLETON CITY	8	24	61	1						10	90	0	10,000		2			5M	3	-
CEDAR CREEK	ASHLAND	2	20	61	1						25	0	75	10,000	1				29M	10	-
FLAT RIVER CREEK	FLAT RIVER	7	26	61	1						10	90	0	10,000	1				4M	1	-
HONEY CREEK	HARVEY	6	20	61	1						10	90	0	1,000		2			3M	7	-
INDIAN MOUND LK	IATAN	7	7	61		2					0	100	0	2,000		2			4A	6	-
HORSE CREEK	LOCKWOOD	2	15	61			3				35	0	65	850	1				3M	10	-
FOREST PK LAKES	ST LOUIS	5	29	61		2					50	50	0	6,000		2			-	9	-
WILSON CREEK	SPRINGFIELD	6	2	61				4			90	10	0	-		2			5M	2	-
DUBOIS CREEK	WASHINGTON	6	13	61		2					5	80	15	350	1				-	1	-
STARKS LAKE	WAVERLY	4	22	61					5		3	97	0	3,600		2			3A	7	-
EAST FK TEBO CR	WINDSOR	8	24	61	1						10	90	0	7,500		2			5M	3	-
MONTANA																					
YELLOWSTONE RIV	BILLINGS	7	12	61		2					0	0	100	500			3		-	-	2
E GALLATIN RIVER	BOZEMAN	6	25	61			3				25	0	75	50				4	-	1	-
BLUEWATER CREEK	FROMBERG	6	16	61		2					100	0	0	-	1				4M	-	-
YELLOWSTONE RIV	LIVINGSTON	7	10	61						6	25	0	75	-				4	45M	1	-
W GALLATIN RIV	MANHATTAN	7	24	61		2					-			-		2			6M	2	-
RATTLESNAKE CR	MISSOULA	8	5	61				4			81	19	0	338	1				1M	-	-
CLARK FORK COL R	MISSOULA	9	25	61				4			100	0	0	1,500		2			15M	1	-
NEBRASKA																					
BAZILLE CREEK	CREIGHTON	6	28	61				4			20	0	80	-		2			1M	2	-

REPORT OF POLLUTION-CAUSED FISH KILLS
CUMULATIVE LISTING OF REPORTS RECEIVED AS OF DATE OF TABULATION

RIVER OR LAKE AFFECTED	NEARBY TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	IMPUTED CAUSE OF KILL: UNKNOWN (1)	AGRICULTURAL OPERATIONS (2)	AGRICULTURAL PESTICIDES (3)	DOMESTIC SEWAGE (4)	INDUSTRIAL WASTES (5)	OTHER (6)	UNKNOWN (7)	TYPE OF FISH KILLED (PERCENT): GAME	FORAGE	TRASH	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT: DA.	HR.
NEW HAMPSHIRE																						
PENICHASSET RIV	BRISTOL	7	28	61					4	5		0	0	100	250				4	300A	1	-
SUGAR RIVER	CLAREMONT	8	24	61				3	4			0	0	100	3,500		2			4M	1	-
PLEASANT LAKE	DEERFIELD	7	6	61		2						25	0	75	400				4	-	3	-
LAKE SKATUTAKEE	HARRISVILLE	7	21	61		2						0	0	100	500				4	70A	10	-
COUNTRY POND	KINGSTON	8	—	61					4			40	30	30	-		2			-	60	-
BERRYS BROOK	RYE	5	12	61		2						0	100	0	-			3		700A	7	-
ASHUELOT RIVER	WINCHESTER	8	7	61					4			0	0	100	1,000		2			3M	2	-
NEW JERSEY																						
PEPAMPA CREEK	GIBBSTOWN	5	25	61					4			0	0	100	-				4	-	-	-
MANTUA CREEK	MANTUA	9	27	61							6	0	50	50	-			3		3M	1	-
DELAWARE RIVER	NATIONAL PARK	4	19	61						5		0	0	100	-				4	-	-	-
MATTHEWS BROOK	THOROFARE	2	25	61							6	0	0	100	-	1				1M	-	-
NEW MEXICO																						
HAGERMAN CANAL	ROSWELL	6	23	61		2						10	0	90	-	1				20M	-	-
BONITO LAKE	RUIDOSO	7	19	61						5		100	0	0	4,500	1				18A	-	-
RUIDOSO RIVER	RUIDOSO	5	27	61						5		100	0	0	-	1				1M	3	-
NEW YORK																						
ELLICOTT CREEK	AMHERST	6	30	61				3				-			-	1				4M	-	-
TREMPER KILL	ANDES	8	23	61					4			15	70	15	5,500	1				1M	2	-
CODDAYURA LAKE	ARGYLE	6	9	61						5		20	0	80	3,000		2			3A	-	-
KORBY LAKE	BLOOMING GROVE	9	20	61							6	-			1,000				-	-	-	-
BROCKPORT CREEK	BROCKPORT	6	22	61						5		0	20	80	1,200		2			1M	-	-
OTIS CREEK	BROCKPORT	6	9	61							6	0	100	0	-			3		-	-	-
CANANDAIGUA	CANANDAIGUA	7	14	61				3				-			250		2			-	-	-
BLACK CREEK	CHURCHVILLE	1	9	61					4			30	70	0	1,000		2			3M	-	-
OWASCO INLET	GROTON	9	20	61					4			15	50	35	3,000	1				2M	1	-
CALLICOON CREEK	JEFFERSONVILLE	7	13	61					4			10	90	0	2,000	1				-	-	-
DELAWARE RIVER	JEFFERSONVILLE	7	12	61						5		5	95	0	2,000	1				-	1	-
WILKINS CREEK	LIVONIA	6	10	61						5		0	50	50	800	1				-	1	-
WEST RIVER	MIDDLESEX	1	12	61					4			-			-				-	-	-	-
WOODBURY CREEK	MOUNTAINVILLE	8	18	61					4			0	0	100	-				4	1M	-	-
SAUGUOIT CREEK	NEW HARTFORD	8	3	61					4			1	29	70	1,000		2			2M	1	-
BARGE CANAL	NEWARK	8	25	61					4			0	50	50	-		2			1M	-	8
MURDER CREEK	NORTH DARIEN	10	9	61		2						20	50	30	2,500	1				1M	-	-
OLEAN CREEK	OLEAN	7	17	61							6	10	20	70	2,000			3		-	3	-
NORMAN KILL TRIB	SCHENECTADY	7	12	61				3				5	80	15	250			3		3M	2	-
CANANDAIGUA	SHORTSVILLE	7	14	61				3				5	60	35	200		2			-	-	-
SALMON CREEK	SODUS CENTER	7	12	61							6	2	98	0	1,000		2			-	-	-
MAHWAH RIVER	SUFFERN	9	14	61							6	1	4	95	1,000			3		-	-	-
ONONDAGA CREEK	TULLY	8	31	61						5		10	60	30	-				-	13M	3	-
GANARGUA CREEK	VICTOR	9	19	61				3				0	70	30	1,000		2			-	-	-
HUDSON RIVER	WARWICK	7	25	61		2					6	3	97	0	300	1				-	-	-
SENECA RIVER	WATERLOO	10	17	61				3	4			-			-		2			1M	2	-
MARL BED POND	WAYLAND	9	26	61					4			0	20	80	4,000		2			3A	3	-
NORTH CAROLINA																						
CANE RIVER	BURNSVILLE	10	26	61							6	-			-		2			10M	-	-
SLOCUM CREEK	CHERRY POINT	10	3	61							6	0	100	0	5,000,000				-	-	-	-
LITTLE RIVER	FORT BRAGG	9	16	61				3				-			50,000	1				20M	2	-
CATAWBA CREEK	GASTONIA	11	12	61							6	10	80	10	3,000		2			-	-	-
ROCKY RIVER	NORWOOD	11	2	61							6	10	80	10	-		2			-	-	-
ROCKY RIVER	SILER CITY	10	29	61							6	30	40	30	-	1				-	-	-
CHOWAN RIVER	WINTON	9	15	61							6	-			-			3		10M	3	-
NORTH DAKOTA																						
HARVEY RESVR	HARVEY	6	17	61		2						80	20	0	22,000	1				86A	-	-
SOURIS RIVER	MINOT	6	—	61				3				35	10	55	-		2			40M	-	-
LITTLE MUDDY RIV	WILLISTON	2	—	61					4			-			-				-	-	-	-

REPORT OF POLLUTION-CAUSED FISH KILLS
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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL						TYPES OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	SEWAGE TREATMENT FACILITIES (10)	AGRICULTURAL-RUNOFF (20)	DOMESTIC SEWAGE (30)	INDUSTRIAL WASTES (40)	OTHER (50)	UNKNOWN (60)	GAME (10)	PANFISH (20)	TOTAL (100)		TOTAL (10)	HEAVY (20)	MODERATE (30)	LIGHT (40)		DAYS	MILES
OHIO																					
INDIAN CREEK	AKRON	7	19	61			3				0	25	75	135				4	-	-	-
PLUM CREEK	BRUNSWICK	1	19	61	1						0	50	50	200			3		-	1	-
CENTER FK CREEK	CARROLLTON	7	10	61		2					-			500				4	-	1	-
TRIB/ROCKY RIVER	CLEVELAND	4	19	61				5			0	80	20	-				4	-	10	-
ROCKY RIVER	CLEVELAND	6	30	61			3				0	95	5	450			3		2M	1	-
BIG WALNUT CREEK	COLUMBUS	2	23	61				5			1	99	0	300				4	-	-	-
ALUM CREEK	COLUMBUS	6	20	61				4			75	5	20	1,385			3		3M	1	-
SCIOTO RIVER	COLUMBUS	10	--	61			3				0	0	100	50				4	-	-	-
BOKES CREEK	EAST LIBERTY	5	9	61					5		1	95	4	280			3		1M	-	-
ST JOSEPH RIVER	EDGERTON	7	12	61						6	10	20	70	1,000		2			-	-	-
SANDUSKY RIVER	FREMONT	1	16	61	1						2	90	8	11,000			3		4M	10	-
TAYLOR CREEK	KENTON	8	15	61			4				0	95	5	100				-	3M	3	-
LUDLOW CREEK	LAURA	7	18	61		2					10	40	50	225			3		1M	-	-
SUGAR CREEK ,	LIMA	1	3	61			3				0	0	100	30				4	1M	-	-
SUGAR CREEK	LIMA	3	2	61			3				10	0	90	250				4	-	10	-
AUGLAIZE RIVER	LIMA	7	5	61				4			-			-			3		4M	-	-
BEAVER CREEK	LISBON	1	31	61					5		-			-				-	-	-	-
BLACK RIVER	LODI	10	--	61		2					0	100	0	2,000				4	-	-	-
BLACK FORK RIVER	MANSFIELD	2	27	61					5		-			-				-	3M	-	-
INDIAN RUN	MARIETTA	5	11	61				4			2	93	5	22,000	1				1M	2	-
ROCKY RIVER	MEDINA	8	4	61			3				-			-			3		2M	-	-
PANTHER CREEK	NEWTOWN	9	29	61						6	0	98	2	260				4	-	-	-
HURON RIVER	NORWALK	9	13	61				4			3	96	1	30,000	1				2M	-	-
SYCAMORE CREEK	PICKERINGTON	6	5	61				4			10	82	8	3,400			3		2M	10	-
PLUM BROOK	SANDUSKY	7	3	61					5		0	0	100	123				-	-	-	-
BUCK CREEK	SPRINGFIELD	9	25	61						6	0	100	0	2,700				4	2M	-	-
ROCK CREEK	TIFFIN	6	20	61				4			-			300				4	-	-	-
MAUMEE RIVER	TOLEDO	5	21	61				4			98	0	2	1,600				4	-	-	-
SANDUSKY RIVER	UPPER SANDUSKY	6	2	61			3				-			-				4	3M	10	-
SANDUSKY RIVER	UPPER SANDUSKY	8	21	61			3				20	70	10	150			3		-	-	-
COUNTY DITCH	WOOSTER	6	13	61						6	0	100	0	25				4	1M	-	-
OREGON																					
W FK HOOD RIVER	HOOD RIVER	9	1	61					5		100	0	0	-		2			30M	2	-
WALLOWA RIVER	JOSEPH	8	22	61				4			98	1	1	2,300	1				1M	15	-
MEACHAM CREEK	MEACHAM	6	23	61					5		90	0	10	10,000	1				5M	-	-
STANFIELD DITCH	STANFIELD	6	15	61		2					10	0	90	-		2			3M	1	-
FAWCETT CREEK	TILLAMOOK	6	19	61					5		60	0	40	9,000				-	1M	-	6
PENNSYLVANIA																					
BEAVER CR/TRIB	ABBOTTSTOWN	12	4	61				4			20	80	0	600			3		1M	1	-
WALTZ CREEK	ACKERMANVILLE	9	14	61				4			75	25	0	850				4	1M	1	-
BARSHINGER CREEK	ADAMSVILLE	10	15	61				4			10	90	0	2,200		2			1M	2	-
PINE CREEK	ALLISON PARK	6	29	61				4			50	50	0	200			3		-	1	-
LITTLE BEAVER R	BEAVER	6	--	61					5		100	0	0	100				4	-	-	3
TODD RUN	BEDFORD	4	26	61					5		20	80	0	1,500		2			1M	2	-
BUFFALO RUN	BELLEFONTE	8	6	61				4			50	50	0	-				4	-	2	-
BELLS GAP RUN	BELLWOOD	3	17	61	1						80	20	0	890	1				3M	3	-
SANDY HOLLOW CR	BERLIN	9	29	61		2					40	60	0	200				4	1M	1	-
LEHIGH RIVER	BETHLEHEM	9	24	61				4			100	0	0	350			3		1M	2	-
LEHIGH RIVER	BETHLEHEM	10	1	61				4			20	80	0	1,477			3		1M	1	-
CONEWAGO CREEK	BIGLERVILLE	9	25	61				4			50	50	0	6,025		2			2M	3	-
CONEWAGO CR TRIB	BIGLERVILLE	12	2	61		2					0	100	0	100				4	-	1	-
LEHIGH CANAL	BOWMANSTOWN	8	4	61				4			10	90	0	1,500			3		1M	3	-
WEST SWAMP CREEK	BOYERTOWN	9	27	61				4			25	75	0	-	1				2M	1	-
PANTHER RUN	BUTLER	3	30	61					5		50	50	0	600			3		1M	1	-
GREENS CREEK	BUTLER	5	28	61					5		25	75	0	-	1				2M	1	-
LACKAWANNA RIVER	CARBONDALE	9	18	61				4			50	50	0	5,000			3		2M	1	-
W BR TIONESTA CR	CLARENDON	11	5	61				4			5	95	0	50,250		2			9M	2	-
DARBY CREEK	CLIFTON HEIGHTS	7	2	61				4			10	90	0	-				4	1M	2	-
W BRANDYWINE CR	COATESVILLE	5	22	61				4			50	50	0	200				4	4M	2	-
ALLEGHENY RIVER	COUDERSPORT	10	4	61				4			20	80	0	19,000		2			2M	2	-
WILLOUGHBLY RUN	CUMBERLAND TWP	7	20	61						6	50	50	0	102				4	-	-	12
SECHLER RUN	DARVILLE	4	26	61				4			100	0	0	364		2			1M	-	12
SCOTT CREEK	DELTA	7	20	61				4			15	85	0	1,650		2			1M	1	-
PARKE RUN	DOWNINGTOWN	9	5	61				4			40	60	0	84			3		1M	1	-
ALLEGHENY RIVER	DUQUESNE	6	13	61		2					100	0	0	10				4	-	2	-
L LOYALSOCK CR	DUSHORE	7	--	61				4			60	40	0	900			3		-	-	-
HACOBY CREEK	EAST GREENVILLE	12	11	61				4			25	75	0	400			3		1M	1	-
DELAWARE RIVER	EASTON	12	25	61						6	-			-		2			50M	9	-
SKIPPACK CREEK	ELROY	11	13	61				4			25	75	0	250				4	-	-	-
PINE RUN	FELTON	8	3	61		2					10	90	0	2,525		2			1M	-	12
PINE CREEK	FOUNTAIN	9	14	61				4			30	70	0	5,719			3		-	2	-
FRENCH CREEK	FRANKLIN	9	11	61				4			35	65	0	1,130		2			2M	1	12
OIL CREEK	HANOVER	6	10	61				4			25	75	0	2,637		2			-	-	6
SLAGEL RUN	HANOVER	11	18	61				4			50	50	0	50				4	1M	-	12
LEHIGH RIVER	HOPEVILLE	5	6	61				4			50	50	0	4,168		2			-	1	-
LEHIGH RIVER	HOPEVILLE	6	7	61				4			50	50	0	8,333		2			-	2	-

REPORT OF POLLUTION-CAUSED FISH KILLS
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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL	IMPUTED CAUSE OF KILL	TYPE OF FISH KILLED (PERCENT)	ESTIMATED NUMBER OF FISH KILLED	SEVERITY	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL OXYGEN EFFECT
		MONTH DAY YEAR	(11) (12) (13) (14) (15) (16)	GAME FORAGE TRASH		TOTAL (11) (12) (13) (14)		DA. HR.
PENNSYLVANIA CONT.								
L CONESTOGA CR	LANCASTER	5 31 61	6	50 50 0	161	3	1M	1 -
L CONESTOGA CR	LANCASTER	6 7 61	6	45 55 0	519	3	1M	1 -
CHESTER CREEK	LENNI	6 19 61	4	25 75 0	2,306	2	6M	2 -
KISHACOQUILAS CR	LEWISTOWN	5 18 61	4	-	-	4	-	- 6
DELAWARE CANAL	LUMBERVILLE	12 30 61	4	20 80 0	11,000	2	9M	7 -
VALLEY CREEK	MALVERN	6 3 61	5	0 100 0	-	4	-	- 2
DRY RUN	MIDLAND	6 9 61	5	0 100 0	2,500	4	2M	1 -
COLKINS CREEK	MILANVILLE	9 6 61	4	50 50 0	500	2	1M	1 -
WYOMISSING CREEK	MOHNTON	1 28 61	5	50 50 0	-	3	3M	7 -
TULPEHOCKEN CK	MYERSTOWN	7 15 61	4	30 70 0	-	4	2M	1 -
LCR CANAL	NORTHAMPTON	12 19 61	4	50 50 0	12,700	2	3M	2 -
BELMONT RUN	PARADISE	3 13 61	3	50 50 0	100	4	-	- -
WAGNERS RUN	POCONO LAKE	7 6 61	6	100 0 0	28	4	-	1 -
SO FK BEAVER CR	QUARRYVILLE	11 28 61	4	20 80 0	26	4	-	- 12
LICKING RUN CR	QUAKERTOWN	1 3 61	5	11 89 0	4,000	1	2M	3 -
GULPH CREEK	RADNOR TWP	5 26 61	4	50 50 0	1,200	1	2M	3 -
CONEWANGO CREEK	RUSSELL	9 6 61	6	50 50 0	2,000	2	3M	2 -
RUNNING RUN	RYOT	7 2 61	5	10 90 0	6,000	3	2M	1 -
BRUSH RUN/TRIB	SOUTH BEAVER TW	1 2 61	1	50 50 0	2	1	2M	3 -
COCORUS CREK	SABINAN	5 19 61	4	20 80 0	600	3	1M	7 -
LICKING CREEK	SALUVIA	10 1 61	5	0 100 0	100	4	-	3 -
CLEARFIELD CREEK	SANDYTOWN	6 -- 61	4	50 50 0	200	3	2M	7 -
PICCADILLY CREEK	SCHUYLKILL TWP	7 -- 61	4	-	-	-	-	- -
DENNIS CREEK	ST THOMAS	8 8 61	2	50 50 0	9,010	3	3M	1 -
SLAMMONS RUN	STRINGTOWN	9 18 61	4	0 100 0	900	1	-	3 -
SUSQUEHANNA RIV	SUNBURY	10 9 61	1	15 70 15	1,000,000	2	9M	15 -
CRUM CREEK	SWATHMORE	7 -- 61	4	30 70 0	2,172	2	1M	1 -
INDIAN CREEK	TELFORD	11 15 61	3	30 70 0	990	3	1M	2 -
LAUREL RUN	TEMPLE	8 9 61	4	25 75 0	-	3	3M	2 -
GULPH CREEK	WAYNE	5 28 61	5	100 0 0	568	3	1M	3 -
PUSEY RUN	WEST GROVE	7 31 61	2	0 100 0	25	4	-	1 -
W BR CLARION RIV	WILCOX	9 21 61	2	25 65 0	16,700	1	6M	3 -
RHODE ISLAND								
ALLENDALE POND	NO PROVIDENCE	6 25 61	4	0 50 50	200	4	-	1 -
SOUTH CAROLINA								
CATAWBA RIVER	GREAT FALLS	6 -- 61	6	-	-	-	-	- -
BROAD SWAMP	KINGSTREE	11 11 61	4	-	-	2	2M	- -
SOUTH DAKOTA								
JAMES RIVER	MITCHELL	2 -- 61	3	20 10 70	-	3	40M	30 -
TENNESSEE								
RICHLAND CREEK	DAYTON	6 12 61	4	25 25 50	-	2	2M	2 -
BOONE RESVR	JOHNSON	11 10 61	4	5 15 80	1,250,000	2	200A	- -
BARREN FORK RIV	MCMINNVILLE	10 29 61	3	10 60 30	-	2	2M	2 -
CHAMBERS CREEK	SAVANNAH	4 26 61	4	-	9,000	2	1M	4 -
WHITE CREEK	WHITE CREEK	8 22 61	2	10 1 89	500	3	-	- 3
TEXAS								
SAN ANTONIO RIV	BERGS MILL	7 21 61	3	10 0 90	-	4	10M	- -
KIOWA CREEK	DARQUSETT	3 24 61	5	90 90 0	-	1	1M	8 -
TAYLORS BAYOU	HAMSHIRE	8 18 61	6	5 5 90	-	2	10M	3 -
BOSQUE RIVER	HICO	6 8 61	6	-	-	2	10M	2 -
STAMPEDE CREEK	HOOBY	6 9 61	2	20 30 50	-	2	6M	2 -
SALADO CREEK	SAN ANTONIO	3 30 61	4	100 0 0	-	3	1M	7 -
UTAH								
UTAH LAKE	PROVO	6 3 61	4	85 0 15	30,000	2	30M	6 -
UTAH LAKE	PROVO	7 28 61	4	90 0 10	9,000	2	3M	3 -

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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			IMPUTED CAUSE OF KILL								TYPE OF FISH KILLED (PERCENT)			ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	GAME	PANFISH	OTHER		TOTAL (1)	MAJOR (2)	MODERATE (3)	MINOR (4)		DA.	HR.
VIRGINIA																							
BEAVER CREEK	BRISTOL	4	29	61			3						0	0	100	325	1				3M	3	-
SHENANDOAH RIV	BROADWAY	8	1	61				4					0	0	100	300			3		1M	-	-
BLACKWATER RIV	FRANKLIN	8	22	61				4					0	100	0	-				4	3M	-	-
BROADDUS LAKE	GAYLORD	3	7	61	2								17	83	0	6,000	1				10A	-	-
LAKE SHENANDOAH	HARRISONBURG	4	22	61	2								10	90	0	42,900	1				39A	-	-
HOLSTON RIVER	HOLSTON	2	23	61				4					-			-	1				40M	-	-
JAMES RIVER	HOPEWELL	5	29	61				4					0	100	0	198,000		2			14M	-	-
DRAGON RUN	KING-QUEEN CO	7	31	61								6	-			150	1				-	-	-
ELIZABETH RIVER	NORFOLK	5	17	61			5						-			-				-	-	-	-
LAKE JOYCE	NORFOLK	7	26	61			3						0	95	5	2,000			3		20A	-	-
POUND RIVER	POUND	3	6	61			3						-			-				4	7M	-	-
PEPPERMINT CREEK	RICHMOND	5	24	61					5				0	0	100	100	1				1M	-	-
JAMES RIVER	RICHMOND	8	9	61				4					-			-				-	-	-	-
MASONS CREEK	SALEM	7	4	61					5				0	100	0	1,000			3		1M	-	-
RAPPAHANNOCK RIV	SHARPS	5	14	61								6	0	90	10	3,000				4	-	-	-
WASHINGTON																							
GREEN RIVER	AUBURN	6	27	61					5				90	0	10	100				5	5	5	5
TRIB TO SCHRIBER	LYNNWOOD	8	24	61					5				00	00	0	-				5	1M	5	5
DUWAMISH RIV	RENTON	10	9	61				4					00	0	0	2,000	1				1M	5	5
CLOVER CREEK	TACOMA	6	28	61								6	00	00	0	-				5	1M	5	5
CLOVER CREEK	TACOMA	5	19	61								6	75	25	0	-				5	1M	5	5
WEST VIRGINIA																							
ELK 2 MI STREAM	CHARLESTON	5	16	61					5				0	90	10	2,000	1				6M	3	-
OHIO RIVER	HUNTINGTON	10	22	61				4					1	49	50	-			3		500	3	-
LAUREL CREEK	OCEANA	2	17	61	1								25	5	75	10,000	1				31M	7	-
LAUREL/C F CR	OCEANA	6	17	61	1								10	10	80	10,000		2			32M	6	-
SO BR POTOMAC R	PETERSBURG	5	25	61				4					10	0	90	2,500			3		14M	1	-
L TEN MILE CR	WALLACE	8	--	61					5				10	40	50	-		2			3M	-	-
WISCONSIN																							
L MOON LAKE	CLAYTON	5	13	61				4					0	0	100	2,000	1				27A	-	-
SCOTCH CREEK	EDGAR	6	11	61				4					10	60	30	-		2			2M	-	-
SIX MILE CREEK	WAUKAKEE	6	6	61				4					5	0	95	10,000	1				4M	2	-
WYOMING																							
CASPER CREEK	CASPER	2	16	61					5				-			-				-	2M	3	-

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